AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1 (canceled).

2 (currently amended). An [[The]] image processing computer system ~~as set forth in claim 1, further~~ for a photogrammetric analytical measurement using a picture having an image of a target, the target having at least three main reference point areas and at least one assistant reference point area, each of the main and assistant reference point areas being a high luminance point area surrounded by a low luminance area, said computer system comprising:

a target-image extractor that extracts the image of the target from the picture, by detecting high luminance point areas, each corresponding to one of the main and assistant reference point areas of the target;

an image processor that processes the extracted image of the target to determine a two-dimensional position of each of the main and assistant reference point areas of the target with respect to a two-dimensional picture coordinate system defined on the image;

a first calculator that calculates three-dimensional positions of the main reference point areas with respect to a three-dimensional camera coordinate system defined on a camera that photographs the picture;

a second calculator that calculates two-dimensional positions of the main reference point areas with respect to a two-dimensional image-plane coordinate system, defined on an image plane of the camera, based on the three-dimensional positions of the main reference point areas calculated by the first calculator;

a third calculator that calculates camera parameters based on the two-dimensional positions of the main reference point areas with respect to the two-dimensional picture coordinate system and the two-dimensional positions of the main reference point areas with respect to the two-dimensional image-plane coordinate system, the camera parameters including a position and a direction of the camera when the picture is photographed;

a fourth calculator that calculates a three-dimensional position of the assistant reference point area with respect to the three-dimensional camera coordinate system based on the camera parameters calculated by ~~said~~ the third calculator;

a fifth calculator that calculates a two-dimensional position of the assistant reference point area with respect to the two-dimensional image-plane coordinate system based on the three-dimensional position of the assistant reference point area calculated by ~~said~~ the fourth calculator; and

a determiner that determines whether the camera parameters calculated by said third

calculator are correct by comparing the two-dimensional position of the assistant reference

point area obtained by ~~said~~ the image processor with the two-dimensional position of the

assistant reference point area calculated by ~~said~~ the fifth calculator.

3 (canceled).

4 (currently amended). An [[The]] image processing method ~~as set forth in claim 3,~~

~~further~~ for a photogrammetric analytical measurement using a picture having an image of a

target, the target having at least three main reference point areas and at least one assistant

reference point area, each of the main and assistant reference point areas being a high

luminance point area surrounded by a low luminance area, comprising:

extracting the image of the target from the picture, by detecting high luminance point

areas, each corresponding to one of the main and assistant reference point areas of the target;

processing the extracted image of the target to determine a two-dimensional position

of each of the main and assistant reference point areas of the target with respect to a two-

dimensional picture coordinate system defined on the image;

calculating three-dimensional positions of the main reference point areas with respect

to a three-dimensional camera coordinate system defined on a camera that photographs the

picture;

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calculating two-dimensional positions of the main reference point areas with respect to a two-dimensional image-plane coordinate system, defined on an image plane of the camera, based on the three-dimensional positions of the main reference point areas;

calculating camera parameters based on the two-dimensional positions of the main reference point areas with respect to the two-dimensional picture coordinate system and the two-dimensional positions of the main reference point areas with respect to the two-dimensional image-plane coordinate system, the camera parameters including a position and a direction of the camera when the picture is photographed;

calculating a three-dimensional position of the assistant reference point area with respect to the three-dimensional camera coordinate system based on the calculated camera parameters;

calculating a two-dimensional position of the assistant reference point area with respect to the two-dimensional image-plane coordinate system based on the calculated three-dimensional position of the assistant reference point area; and

determining whether the camera parameters are correct by comparing the two-dimensional position of the assistant reference point area with respect to the two-dimensional picture coordinate system with the two-dimensional position of the assistant reference point area with respect to the two-dimensional image-plane coordinate system.

5 (canceled).

6 (currently amended). A [[The]] memory medium ~~as set forth in claim 5, wherein~~ storing an image processing program for a photogrammetric analytical measurement using a picture having an image of a target, the target having at least three main reference point areas and at least one assistant reference point area, each of the main and assistant reference point areas being a high luminance point area surrounded by a low luminance area, said program ~~further comprises~~ comprising:

extracting the image of the target from the picture, by detecting high luminance point areas, each corresponding to one of the main and assistant reference point areas of the target;

processing the extracted image of the target to determine a two-dimensional position of each of the main and assistant reference point areas of the target with respect to a two-dimensional picture coordinate system defined on the image;

calculating three-dimensional positions of the main reference point areas with respect to a three-dimensional camera coordinate system defined on a camera that photographs the picture;

calculating two-dimensional positions of the main reference point areas with respect to a two-dimensional image-plane coordinate system, defined on an image plane of the camera, based on the three-dimensional positions of the main reference point areas;

calculating camera parameters based on the two-dimensional positions of the main reference point areas with respect to the two-dimensional picture coordinate system and the two-dimensional positions of the main reference point areas with respect to the two-

dimensional image-plane coordinate system, the camera parameters including a position and a direction of the camera when the picture is photographed;

calculating a three-dimensional position of the assistant reference point area with respect to the three-dimensional camera coordinate system based on the calculated camera parameters;

calculating a two-dimensional position of the assistant reference point area with respect to the two-dimensional image-plane coordinate system based on the calculated three-dimensional position of the assistant reference point area; and

determining whether the camera parameters are correct by comparing the two-dimensional position of the assistant reference point area with respect to the two-dimensional picture coordinate system with the two-dimensional position of the assistant reference point area with respect to the two-dimensional image-plane coordinate system.